WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

an insulating film;

a capacitor formed on the insulating film and comprising a bottom electrode, a top electrode, and a dielectric film between the top electrode and the bottom electrode;

a plug passing through the insulating film and connected to the bottom electrode; and

an oxygen barrier film covering the capacitor and the insulating film, and having lower oxygen permeability than the insulating film.

2. The semiconductor device according to claim 1, further comprising a film provided under the insulating film and having lower oxygen permeability than the insulating film.

3. The semiconductor device according to claim 1, further comprising a hydrogen barrier film covering the capacitor and the insulating film, formed inside the oxygen barrier film and having lower hydrogen permeability than the insulating film.

4. The semiconductor device according to claim 1, further comprising a transistor electrically connected to the plug.

5. The semiconductor device according to claim 1, wherein the oxygen barrier film comprises at least one of a silicon nitride film, a silicon oxynitride film,

an aluminum oxide film and a titanium oxide film.

6. The semiconductor device according to claim 1, wherein the plug is formed of tungsten or polysilicon.

7. The semiconductor device according to claim 1, wherein the bottom electrode contains iridium.

8. The semiconductor device according to claim 1, wherein the dielectric film comprises a ferroelectric film.

9. A semiconductor device comprising:

an insulating film;

a capacitor formed on the insulating film and comprising a bottom electrode, a top electrode, and a dielectric film between the top electrode and the bottom electrode;

a plug passing through the insulating film and connected to the bottom electrode; and

an oxygen barrier film formed between the insulating film and the plug, and having lower oxygen permeability than the insulating film.

10. The semiconductor device according to claim 9, further comprising a film provided under the insulating film and having lower oxygen permeability than the insulating film.

11. The semiconductor device according to claim 9, further comprising a transistor electrically connected to the plug.

12. The semiconductor device according to claim 9,

wherein the oxygen barrier film comprises at least one of a silicon nitride film, a silicon oxynitride film, an aluminum oxide film and a titanium oxide film.

13. The semiconductor device according to claim 9, wherein the plug is formed of tungsten or polysilicon.

14. The semiconductor device according to claim 9, wherein the bottom electrode contains iridium.

15. The semiconductor device according to claim 9 wherein the dielectric film comprises a ferroelectric film.

16. A semiconductor device comprising:

an insulating film;

a capacitor formed on the insulating film and comprising a bottom electrode, a top electrode, and a dielectric film between the top electrode and the bottom electrode;

a plug passing through the insulating film and connected to the bottom electrode;

a first oxygen barrier film covering the capacitor and the insulating film, and having lower oxygen permeability than the insulating film; and

a second oxygen barrier film formed between the insulating film and the plug, and having lower oxygen permeability than the insulating film.